

Accelerator Department
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AGS DIVISION TECHNICAL NOTE

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VERTICAL BUMP COIL POWER SYSTEM

A $1/2 \lambda$ vertical bump magnet pair is being built by the Mechanical Engineering group of the AGS Division. The purpose of this magnet system is to allow the adjustment in vertical height of the slow external beam. An adjustment of $\pm .150$ in. is planned.

A battery and a switch in series would suffice to power these magnets. The natural time constant of the magnets appear to equal the current rise time requirement of the bump. The circuit shown in Fig. 1 accomplishes the same thing. The d.c. power supply replaces the battery and the SCR pair performs the switching function. SCR1 fires to close the switch. When SCR2 fired, the associated LC ring extinguishes SCR1 and later extinguishes itself. The waveforms associated with this process are shown in Fig. 2 for the case of L_1 equals 10 millihenries and R_1 equals 0.15 ohms. These parameters are not firm since detail engineering of the magnet is still in progress and these parameters are used here only to examine feasibility of the powering technique.

For this example the components became:

L_2	6 microhenries
C	1600 microfarads at 400 V
R_2	10 ohms - 200 W
SCR1	Westinghouse type 228D - 275A - 200 V
SCR2	Westinghouse type 251D - 63H - 200 V
Diode	Westinghouse type 377H - 240A - 400 V
Power Supply	0-50 V - 200 A

This system appears feasible when the magnet parameters are firm; final components can be determined and ordered.

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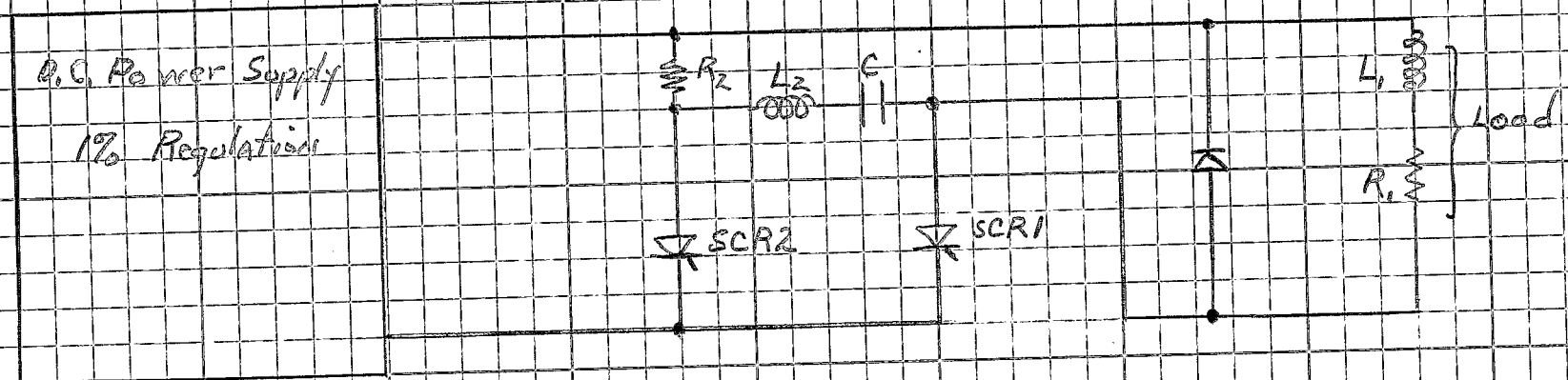
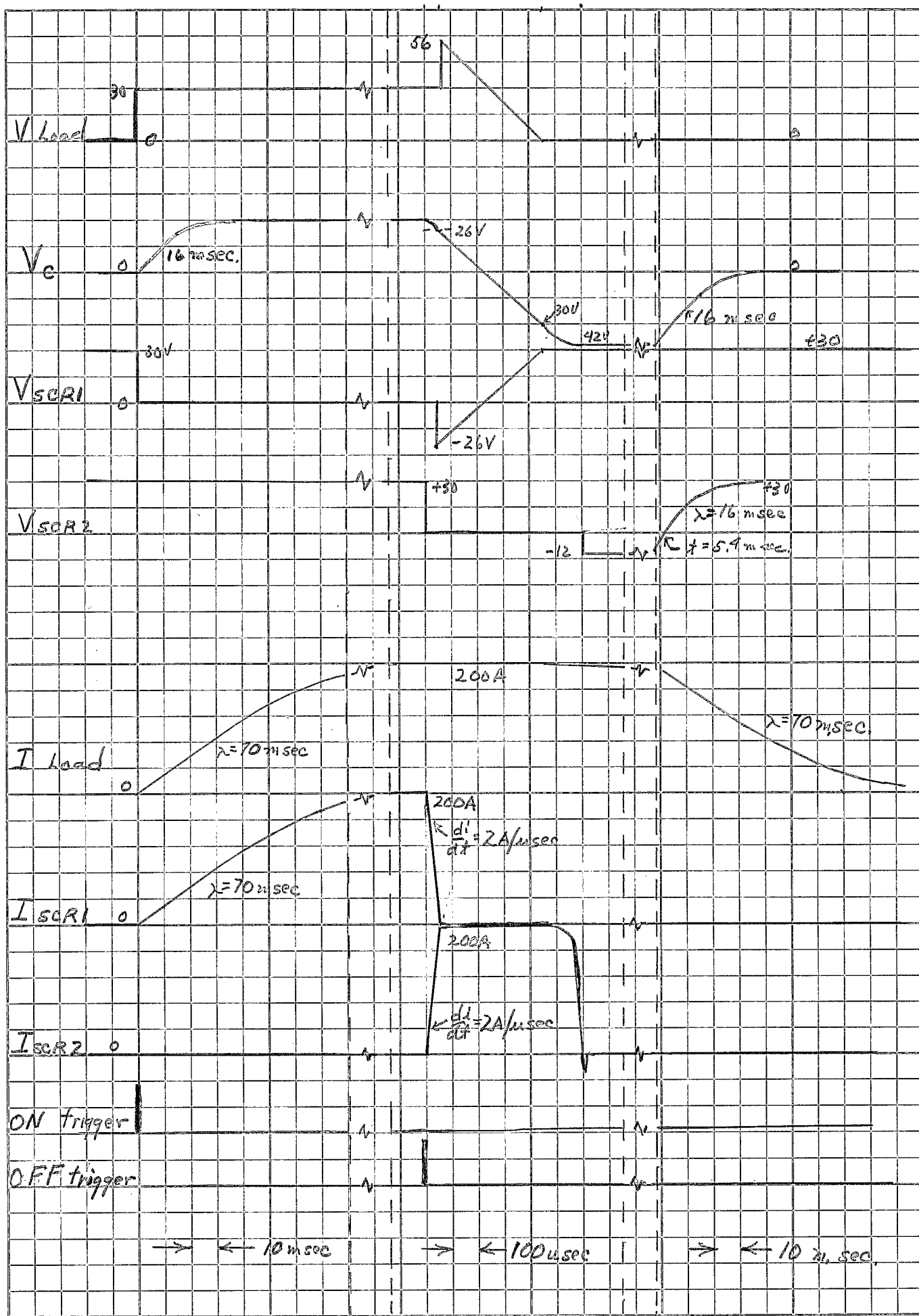


Fig 1



Time

Fig 2